

Date: Nov 23, 1987

Subject: INFORMATION: Location of Passenger Center of Gravity Above the Compressed Seat Cushion for Compliance With § 25.561 and TSO-C39

From: Manager, Aircraft Certification Division, ANM-100

To: Manager, Aircraft Engineering Division, AWS-100,  
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The Aircraft Certification Division has been requested to issue a position on the practice of placing the passenger center of gravity (C.G.) 8.20 inches above the compressed seat cushion when calculating the aircraft interface reactions for the 9-g forward load condition. Our position is that this practice is unacceptable. It was noted that this method of analysis is documented in certain static test reports and comparative analysis reports when showing interface reactions for the forward load condition. It was further noted that the seats are actually tested to fully comply with all the requirements of NAS 809 (i.e., application of the load 10.5 inches above base of body block).

The only document directly approved by the FAA which specifies C.G. locations for static testing of passenger seats is NAS 809. It has only recently come to our attention that Designated Engineering Representatives (DERs) have approved documents which specify C.G. locations different from those in NAS 809. We are correcting this interpretation of the rules by informing all certification offices and all DERs to use 10.5 inches for the vertical C.G. location.

The static 9-g forward load condition does not attempt to duplicate the dynamic test case with respect to peak load factors, C.G. locations or distortions under dynamic loads. The static load conditions specified in § 25.561 are intended to provide an acceptable level of safety when applied using the TSO C39 (NAS 809) body block. The dynamic test conditions required by the new § 25.562 do not specify a C.G. location for the anthropomorphic test dummy. Identifying the location of the C.G. is not necessary since all load measurements are taken directly from the dummy or from the seat structure.

The FAA considers a vertical C.G. location 10.5 inches above the base of the NAS 809 body block acceptable for use in showing compliance with the static test requirements of § 25.561.

Original Signed by  
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